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ABSTRACT

This document provides a framework for the creation of specific research objectives, projects, and programs of special interest to the postsecondary educational community and appropriate for the National Institute of Education. The staff of private foundations, educational and scholarly associations, student representatives, the federal government, academic institutions, and the National Institute of Education were interviewed. High priority areas identified were: (1) students--characteristics and access; (2) motivation and values; (3) teaching--delivery systems; (4) evaluation of outcomes--assessing the value of postsecondary education; (5) governance and management; (6) costs and finance of postsecondary education; and (7) interfaces between secondary and postsecondary education and work. Central to the recommendations made is the necessity to bring the best minds to work together on the problems of postsecondary education. Appointments in NIE as well as the development of an in-house internship program and support for doctoral and postdoctoral studies can supplement the program of research. (Author/KE)

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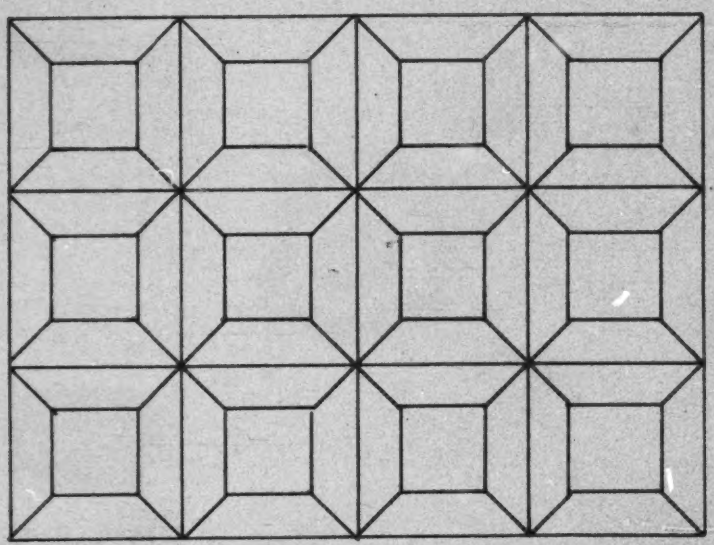
POSTSECONDARY EDUCATION

RESEARCH OPPORTUNITIES FOR NIE



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The National Institute of Education
U.S. Department of Health, Education and Welfare
Washington, D.C. 20208

FINAL REPORT

RESEARCH OPPORTUNITIES IN

POSTSECONDARY EDUCATION

FOR THE NATIONAL INSTITUTE OF EDUCATION

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April 7, 1976

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I. Introduction

The National Institute of Education "has a clear responsibility to provide leadership in the conduct and support of scientific inquiry into the educational process." (Sec. 405 (a) (1), Pub. Law 92-318) Furthermore, "the Director is authorized, through the Institute, to conduct educational research; collect and disseminate the findings of educational research; train individuals in educational research; assist and foster such research, collection, dissemination, or training through grants, or technical assistance to or jointly financed cooperative arrangements with, public or private organizations, institutions, agencies, or individuals; promote the coordination of such research and research support within the Federal Government; and may construct or provide (by grant or otherwise) for such facilities as he determines may be required to accomplish such purposes. As used in this subsection, the term 'educational research' includes research (basic and applied), planning, surveys, evaluations, investigations, experiments, developments, and demonstrations in the field of education (including career education)." (Sec. 405 (e) (1), Pub. Law 92-318).

In pursuit of this responsibility the Director requested that a report be prepared for his use on the needs for research in postsecondary education, with special emphasis on those activities most appropriate for the National Institute of Education.

From March 10 to April 6, 1976, the authors interviewed numerous representatives of the postsecondary education community. Among those interviewed were staff of private foundations, educational and scholarly associations, student representatives, the Federal Government, academic institutions, the National Institute of Education, and other interested parties. Pertinent literature was reviewed and numerous suggestions were received by mail in response to a request from the Director to selected individuals.

The authors express their appreciation to all those who have assisted in this effort and regret that the time available did not allow further consultation with all those who offered assistance.

This report does not attempt to detail specific projects for research but rather tries to indicate major concerns, trends and areas for further investigation. It should not be considered as all inclusive, as the gospel, or the "only way" that things should be done. Obviously the ideas are not original with us, but since they are distilled from many sources, we have not attempted to give specific credit to the source of each. We hope that all of our advisors will recognize some elements of their contributions.

The hope is that this report will provide a framework for the creation of specific research objectives, projects and programs. We trust that the report will start a continuing process of defining directions and priorities for NIE efforts in postsecondary education.

II. Input: Students

Student Characteristics

If we grant that the purpose of postsecondary education is to assist students to learn, research on characteristics of the learners, their variety, their expectations, abilities, and motives is basic.

The changing character of the student population has been well documented. What is still not well understood is how educational opportunities can most effectively be made available and adapted to the range of student characteristics.

We now know that learning ability in many respects improves with age rather than decreases. We also know that learning deficiencies in childhood are critical but not irremediable. Thus productive research is possible upon such topics as differences in learning in educational situations for younger and older learners, the educational needs and strengths of minority group members, the changing motives of women students in our society, the special assets and problems of bilingual learners, and the changing needs of learners at different life stages. As we think of life-long-learning, we can re-evaluate the role of the four-year college in meeting the lifelong needs of students. Perhaps certain needs can be met more efficiently at later age periods through different modes.

Access: What Factors Determine Participation in Postsecondary Education?

Individuals of all ages are presented with a wide variety of post-secondary educational opportunities. Research is needed on the perceptions potential students have of postsecondary education. Are they aware of the

range of possibilities? How do they assess the demands of postsecondary education in relation to their perceptions of their own abilities and work habits? How do their educational aspirations fit with the goals in institutions of postsecondary education (and of their own perceptions of the likely outcomes of postsecondary education.)? In making decisions about whether or not to continue formal education, or what form of education to pursue, what values are individuals trying to achieve? How do their experiences help them revise their decisions?

How do financial factors influence student decisions? How do different patterns of financing and charging for postsecondary education affect entry and continued participation in postsecondary education? Are the effects different for different groups? How successful have open admissions been in reducing inequity? With the increasing tendency to limit enrollments, research on the effect of open admissions is greatly needed.

How do student perceptions of their own futures as adults fit with expert judgments of labor market needs, and other characteristics of the society 5-10-20 years in the future? The Education and Work Group is already studying how 18 year olds and older individuals differ in career exploration.

What kinds of information do students use? Can the information be improved? The National Student Educational Fund has identified a gap. Researc can extend their findings. What is the role of counselors? Can we improve the training and effectiveness of counselors? The Experience-Based Career Education program can provide a start for research in postsecondary career counseling and education.

One of the more important current research efforts in this area is the ACE survey of freshmen. While we heard various criticisms of the sample and

scope of the survey, there was general agreement that data of this sort are valuable especially when coupled with periodic longitudinal surveys.

III. The Process of Education--Teaching and Learning

Ultimately, postsecondary education deals with student learning. Therefore, research on learning and teaching must be one of the fundamental parts of any program in postsecondary education. The effects of changes in financing, changes in admission practices, changes in university management -- all of these must be evaluated in terms of how they affect the learning of students.

Learning

Research in learning in educational settings is timely in that the basic science necessary for progress has recently made great advances. Learning theory has within the last ten or twenty years shifted from an emphasis upon animal learning to an emphasis upon human learning, from emphasizing nonsense syllables and the learning of simple motor skills to an emphasis upon meaningful verbal learning, from the study of simple habits to the study of complex cognitive structures, and from study in simple, one-variable laboratory situations to more complex multivariate analyses. Some of the basic studies in learning theory now involve studies of learning of mathematics, of second languages, or other topics immediately concerned with education. On the whole, however, we lack research knowledge about the nature of learning in educational situations and about how teaching can facilitate more effective learning.

At this point it appears that it would be productive to carry out research on the studies of the learning strategies students actually use,

the ways in which they retrieve and apply their learning outside course examination situations, and the degree to which learning strategies can be modified so that students can develop a more flexible repetoire of strategies. If an effective system of classifying learning strategies can be developed, it would be worthwhile to know how strategies differ for different groups such as older learners versus younger learners, second language learning versus first language learners, minority group or working class learners versus upper middle class majority group learners, etc.

Research has demonstrated that education can be more effective if one adapts it to the current strategies of a group of learners. We need to know how education can help these learners develop additional strategies and use them adaptively. To do this we need a good deal of basic research on cognition as well as research on methods of identifying learning strategies and of teaching new ones.

Motivation and Values

A closely related problem is that of motivation for learning. There is now much greater recognition of the importance of curiosity and intrinsic motivation for learning as important educational goals. In fact, many educators would take the goal of developing motivation for life-long learning as being one of the most important objectives of postsecondary education. The basic researchers in psychology have recently become more and more involved in the relationship between different patterns of rewarding learning and their impact upon long term motivation. Some of the dominant motives in our society, such as need for achievement, are changing. For example, the impact of the changing roles of women upon motivation has educational

significance. Basic research and research in the traditional black colleges is linking motivation and behavior to perceptions of one's own ability to influence one's fate. Support of research in classroom and other educational situations on factors influencing motivation for learning and the nurturing of motivation for life-long learning is important for education.

A closely related area of much current interest is that of the development of values. We know that values are influenced to some degree by college and other educational experiences, perhaps more by peer groups than by professors. Developmental theories of values emphasize the importance of models in determining values, and there is some experimental and anecdotal evidence indicating that faculty members are often significant figures in student's lives. We need further research determining what factors influence the impact of education upon student values.

One of the relics of the period when educators proclaimed the value neutrality of education is ignorance about the role of the scholarly disciplines in the development and integration of values. It may well be that academic experiences provide prerequisites for understanding the application of values to new situations. For example, literature, biography, and the behavioral sciences may actually have an important impact, not so much on the <u>acceptance</u> of the value of altruism, but upon the degree to which students practice altruistic behavior because they gain the ability to see human beings in other nationalities or racial groups as being like themselves in terms of needs, aspirations, and feelings. Concern with values need not imply indoctrination. Rather, research can help us understand how education can be more effective in helping students live the values they profess.

Teaching and Delivery Systems

At the same time that work goes forward on the nature of learning and motivation, it is important that research approach the problem from the standpoint of the teaching side of teaching and learning. Research has already demonstrated the greater effectiveness of certain methods as compared with others (e.g. discussion is superior to lecture for goals of application and thinking). It is unlikely, however, that any one teaching method or any technology is going to have dramatic effects upon learning for all objectives and all students. Rather, we can be more effective with particular kinds of students and with particular objectives if our teaching methods are chosen with respect to these considerations.

Sociological studies of classroom interaction are giving new understanding of the ways in which student and teacher roles interact to affect learning. Sociological research in medical schools demonstrates that implicit values and norms are communicated by the curriculum, the faculty and peer groups.

Statistical techniques now enable us to tease out some of the multivariate factors that affect teaching and with new developments in computer, video and other technological aids added to the teachers tool kit, it is possible to devise educational programs that can reach students who have previously been poorly served by the standard lecture format.

Currently, a large number of programs, special colleges, and individual courses are trying new instructional modes or new curricula. In some instances, these programs involve various interdisciplinary combinations; in other cases they involve a focus around problems rather than the traditional disciplines; and in other cases they involve variations in teaching methods,

methods of evaluation, or the use of technology or other types of atypical educational experiences. We need to develop a taxonomy that will enable us to relate outcomes from these different methods to different goals and to determine what kinds of students are likely to benefit most from them. The contract system, field experience, problem oriented programs, and other innovations have had very little systematic evaluations.

Education is frequently characterized as being inefficient and resistant to technological improvements. We suspect that the reason technological innovations seldom demonstrate improved effectiveness is that the educational delivery system has been highly effective since the invention of the printing press, and even more so since the invention of paperback books and Xerox machines. Thus, the control system against which new delivery systems should be tested is correspondence study.

The current NIE evaluation of open education seems to us a model of what NIE can and should do. As we understand it the following features are significant:

1. Rather than developing an evaluation of a single program such as UMA., NIE developed a taxonomy which placed UMA and other open education programs on common dimensions so that the evaluation could be generalized beyond a specific program.
2. The evaluation involves not only NIE funded programs but also other programs with common features relevant to the dimensions being studied.
3. Potential users of the evaluative information were identified in advance and involved in design of the evaluation.

The Faculty

One cannot think about teaching and learning without thinking about those who are responsible for teaching and planning the learning situation in institutions of postsecondary education -- the faculty. This is an area which lacks a tradition of continued systematic inquiry. So far as we know, there are no current studies of changes in the types of individuals entering academic careers today as compared with earlier periods such as the 1950's and 1960's. We know little about the impact of the tightening job market upon the aspirations, work habits, productivity and effectiveness, of both younger and older faculty members. We hear that faculty are increasingly alienated as a result of lack of mobility and lack of public support for scholarly and educational activities, but we do not know what factors influence alienation versus commitment and productivity. What are the peer group influences, the communication channels, the competing interests that affect faculty enthusiasm and productivity? How do faculty members spend their time and how is this influenced by changes in governance, curriculum, or financing of institutions?

We also know little about the career development of faculty members. There are many tales of academic menopausal periods, but no systematic studies and few data relevant to policy decisions about encouragement of early retirement versus a move upward of compulsory retirement age are available. Studies of the flow of faculty into and through academic careers could benefit from current methodologies in economics and sociology. The effectiveness of training of faculty, the impact of systems of evaluation of faculty for tenure and promotion, the effectiveness of different reward

patterns -- all of these are questions of relevance to the life of academic institutions. Currently there are a large number of faculty development programs with wide variations in approach. While there are several good descriptions, there is no systematic comparative data on their effectiveness. If colleges and universities are truly communities of learners, we need to be concerned about the learning and development of faculty as well as students. Psychological research is giving new recognition to the importance of modeling. Thus faculty members' modes of thinking, enthusiasm about their subject matter, and manifestation of values are likely to be of educational importance. We already have some data confirming this, but we still need additional research on the factors affecting the influence of the faculty member and upon the role of training, reward structure, peer group supports, change of activity, feedback from students, and other factors upon the career development of the faculty members.

We know that intellectual functions continue to develop as one ages, but we know little about the normal patterns of career development of faculty. Is there an academic menopause? Are there significant number of "deadwoods" and if so, can they be brought to life? Currently there are large numbers of programs of faculty development but relatively little evaluation of effectiveness. One would suspect that a program designed to "retread deadwood" would have more difficulty than one that involved faculty in new programs using their strengths as a basis for developing new competencies. In any case, educational research in this area has relevance not only to faculty development but also to our more general interest in adult development and education.

Finally, we recognize the impact of collective bargaining upon faculty morale and faculty participation in institutional governance. Currently we have a great many studies dealing with this topic in terms of its impact upon decision making and the distribution of power, but relatively few in terms of its effect on teaching and learning and the relationships to faculty members and students.

The Curriculum

Research on postsecondary curriculum is a largely undeveloped field. Changes in secondary school curricula have implications for postsecondary curriculum. Most of the disciplines have committees studying curricula or developing new curricular approaches but little research has been done either upon the particular aspects of curricular decisions within a given discipline or upon the broader questions of the effects of required vs. free elective systems, sequential vs. non-sequential arrangements of courses, pyramidal vs. hour-glass, vs. linear patterns of courses, etc. Society needs individuals who can comprehend broad areas and who have the flexibility to shift from one set of problems to another. Yet we do not know whether or not interdisciplinary programs are really better preparation than disciplinary programs or even what factors in disciplinary training affect rigidity or flexibility. Is a liberal arts curriculum better preparation than a vocationally oriented curriculum?

The Setting

Concern about the evaluation of new programs and new colleges leads directly into the broader question of the studies of the academic setting generally and its relationship to learning and teaching. Since the classic

studies of the impact of peer groups upon students carried out by Newcomb and others, there has been a hiatus in research on the broader questions of student development and learning in various types of settings. The rapid growth of community and junior colleges suggests the need for studies of non-residential learning experiences similar to those Newcomb, Sanford, and others have made of residential four-year colleges. We know very little about how commuting students and part-time students fit education into their lives, what factors influence their learning and development, how the newer open-university types of experiences influence students, and how the process of education differs depending upon the setting in which it is carried out. For example, what is the value of foreign study or semester-abroad programs? Do they provide a different perspective than is not available locally? What priority should they have in these tight fiscal times?

Thus far we have said nothing about learning and teaching in graduate and professional education. Increasingly, there are educational units concerned with improving the effectiveness of learning and teaching in professional schools. It seems likely that these units will provide a resource for developing research based policies relevant to improving education outside the traditional liberal arts curriculum. More molar studies of the role of graduate and professional schools with respect to social changes, such as change in our health care or legal systems would also be useful.

IV. Outputs

Postsecondary education is currently under a great deal of pressure to justify public expenditures in view of the presumed or actual declining

economic value of education to the individual. This gives added motivation for research concerned with developing better measures of non-monetary benefits of education both to individuals and to society. Ultimately decisions about educational goals are value decisions, but research can contribute in several ways.

1. Those who establish educational values typically make assumptions about what alumni lack. Research can help in identifying what alumni of education feel they gained and would have liked to gain from higher education. Methods of analysis developed for assessing needs of special populations, such as the handicapped or evaluating skill requirements for jobs in industry or the armed forces could be extended to analysis of the knowledge, skills, and attitudes conducive to the general requirements of our society for its citizens.
2. Those who establish educational goals also often make assumptions about a) relationships between goals (compatibility or incompatibility) and the relationships between means and ends; b) aspirations and expectations of prospective students; c) consensus among the various groups interested in education. These two are researchable questions.

It is obvious that in most cases the true value of college education to an individual can be determined only over the course of a lifetime. Nevertheless, we can certainly get some indicators of major educational outcomes. We can specify behaviors and attitudes that college educated

people should be more likely to possess. We are increasingly able to measure such aspects of cognitive flexibility, ability to see the complexity of problem situations, strategies for learning and solving problems, and ability to postpone closing ones' mind when the data are still out. Studies of abilities, values, and attitudes characterizing those who have been educated should be supplemented by studies of the lives of individuals, such as the longitudinal studies of the Project Talent sample or other intensive studies of smaller numbers of individuals. It may be that one of the important outcomes of education is a meaningful integration of personality. Typical cross-sectional studies of specific outcomes may miss unique interactions of educational experience, persons, and later environment.

There are now underway a number of major studies of social indicators and quality of life. Thus the evaluation of educational benefits and the development of educational indicators can be easily related to major developments in theory and methodology with broader social implications and scientific interest.

There are some specific questions with respect to the evaluation of outputs that have to do with the manner in which assessment can be carried out. We need to study ways in which data can be gathered to influence public attitudes toward the values of education and to provide useful feedback to institutions with respect to evaluating their own programs and the effects of changes in programs on educational outcomes. Since many of the changes involve long term benefits, the problem of evaluation is much like that of studying the genetics of elephants, and we thus will need to develop methodologies that provide quicker feedback on intermediate aspects of

education rather than relying completely upon the study of ultimate criteria of the achievement of educational goals.

In addition to the molar evaluation of the outcomes of education, we obviously need further work upon evaluation of outcomes of a more immediate nature that can be useful to faculty members in developing curricula, and in improving their own teaching, and to administrators and faculty members concerned about evaluating teaching for purposes of making decisions about promotion and salary increases.

Still another category of evaluative information needed is that useful to students. We are less than adequately equipped to give students information valuable to them not only in assessing the progress they have made, but in providing evaluations that will enable students to develop the ability to set standards for themselves that they can use in evaluating their own learning and problem solving after they leave formal postsecondary education.

Grading problems are currently of a good deal of public interest, particularly in relation to the so called "grade inflation". While most of the attacks upon the lack of correlation between grades and later success are probably not methodologically sound, research on the usefulness of grades and alternative methods of evaluating and predicting future achievement could have considerable impact upon education.

Current emphasis on competency based evaluation both with respect to admission to postsecondary programs as well as to credentialing is of widespread interest. NIE's current effort in this area seems to be a sound one and we recommend its continuation.

V. The Institutions, the System, and Relationships to Society

The previous chapters have dealt with the components of postsecondary education -- the students, the process and the outcomes. There is little question as to the importance of research regarding these components, yet there are other areas that also need attention. The settings in which students learn, and teachers teach, are many and varied. They range from the traditional colleges and universities, to the community colleges, to vocational-technical institutes, to correspondence courses in the home, to store-front academies to non-traditional settings for use of various types of media.

Interfaces between Secondary and Postsecondary Education and Work

One of the major areas of concern regarding the relationships of education to society begins with the interfaces between secondary and post-secondary education and work. The secondary schools have long used an information system to direct select students into postsecondary education. A more comprehensive system is necessary so as to assure all secondary students the opportunity to evaluate and choose what is best for them, be it more education or immediate entry into the labor force. A continuum for educational counseling has to be a goal.

The secondary school system has improved its curricula and introduced students to more sophisticated material in earlier grades. Credit-by-examination, advanced placement, and even a few cooperative secondary/postsecondary arrangements have taken advantage of these, thus shortening the time necessary to complete an educational program. Research is needed to determine the best methods for achieving greater integration of both levels of education.

Just as secondary and postsecondary institutions have become closer, so have postsecondary institutions and the world of work. Cooperative education programs, apprenticeships, and other school/work relationships require research and evaluation. NIE is already doing good work in this area.

Governance

The University exists as an organization and as a political milieu. The current research on organizational behavior and organizational development is relevant to college and university management, but relatively little research has been carried out on colleges and universities themselves and their unique organizational characteristics.

The political forces outside and inside the institution contending for power, the coalitions and compromises engendered by the sometimes conflicting, sometimes coinciding interests of those involved are appropriate areas and potentially useful subjects for research.

The roles of presidents, deans, department chairmen and other administrators in determining educational effectiveness is little understood. The costs and gains of extensive faculty and student participation in governance merits study. Of particular interest today is the changing power structure as collective bargaining, state coordinating bodies, and (for public institutions) increasingly active state budget officers constrain the freedom of administrators and faculty to determine institutional policies. This general area is one in which methodology is getting better and better and where political scientists, sociologists, and psychologists all are working with insufficient support.

Diversity of Students and Institutions

The expansion of postsecondary educational opportunities in the last two decades has produced a wide assortment of educational settings and opportunities. Each institution speaks of special missions or market groups, yet little serious work has been done regarding which institution can fulfill which mission best. Duplication of effort certainly occurs, and perhaps it should, but who is doing what for whom needs definition. The anticipated drop in enrollments during the early 80's has pushed educators to look for new markets to fill the empty seats.

The nature of participation by adults and by others in postsecondary education programs needs to be investigated, with special attention given to the effects of this participation on the financing and management of the institution. The adult student is often characterized as one who participates on a part-time, drop-in -- drop-out basis. The wide format of educational modes combined with varying student mixes makes it essential that procedures for obtaining real costs be developed. It then becomes necessary to determine who should pay these costs and the value that the society receives from the experiences. Providing adult literacy education can understandably be accepted as a function that society should pay for, but what subsidy should society pay for training in macramé or contract bridge?

Postsecondary education has always been acclaimed for its diversity. In addition to the definition of missions suggested above, there is a real need to examine the concept of diversity. Private education is often defended as the alternative to public education, yet little has been documented about what contributions private educational institutions provide to society. To what degree do different institutions serve different

populations, achieve differing outcomes, attract differing sources of support?

Institutional Size and Location

In addition to defining the scope, mission and value of postsecondary education and the institutions that deliver it, there is a need to do research on how best to optimize each approach and type. We know very little about the optimal size of institutions. Are there economies of scale? Can certain things be done at one size that can't be accomplished at another? What is the impact of size on student and faculty expenditures of time? What is the effect of geographical distribution and density of institutions? Do consortia provide opportunities and experiences that are cost effective and beneficial that would otherwise not be provided?

The Value of Postsecondary Education to Society

On this same theme there is a need to look at postsecondary education and its relationship to society as a whole. In addition to studies of the values of education in economic and non-economic terms for the individual recommended earlier, it is also necessary to look at the greater question, what value is education to society? Institutions of postsecondary education play a major role in the geographic community in which they are located. They may be a center of culture; they may provide expertise for management in the community; they may be an economic resource. How can they work and relate to other community institutions for the improvement of society? What will changes in, or even the demise of, some of these institutions do to the community, state and nation? These relationships and roles need to be conceptualized. This whole area needs to be investigated not only from the point of view of the economist but also from the areas of communications

research, sociology, political science, anthropology and social psychology.

Financing Postsecondary Education

Practically every Foundation is involved in supporting studies in the financing of postsecondary education. The education associations are concerned. The policy analysts in the Government rank this as a primary concern.

NIE will be holding a conference this summer to determine the national priority issues in finance and productivity. The number of people and organizations working in this area is large, and therefore there is some question as to what role NIE might appropriately play. There is a high need for synthesis of information, and for studies of practices that work and don't work. Effort might usefully be placed on the basic questions of the proper mix of support and the advantages and disadvantages of one type over another. The community college reached a new area of finance for postsecondary education by drawing on the local community tax base for support. In this area they now compete with the elementary-secondary school system for support. What are the long range effects of this competition? With 90% of Federal support for postsecondary education being in the form of student assistance, what are the effects on the various types of institutions? While it is conceivable that student aid dollars preserve and assist one type of institution, do they have the same value for all? How do they affect the educational opportunities for students not eligible for aid? How can major graduate research institutions be best supported so as to maintain the intellectual and research capability of the Nation?

Institutional Evaluation

Very little is known about the growth and development of educational institutions, particularly different types such as "traditionally black" institutions, experimental colleges, etc. Are there certain normal patterns of development? How do we evaluate institutional success, quality and growth? Research is needed in the area of institutional evaluation, not from the point of view of doing more evaluations but rather in developing new methods of evaluation. This information would be valuable to the accrediting process, the governance process, and planning and funding efforts at the local, state, and Federal level. With the leveling of enrollments and tight fiscal times institutions are being told to account for their actions, to be cost effective, and to be efficient. Boards of Control, government at all levels, and the consumer may be asking the wrong questions and consequently wrong actions may take place. As we indicated in the section on outcomes, better evaluative procedures and instruments may suggest new questions and better answers.

Partnerships with Others

Many of the private foundations, the Fund for the Improvement of Postsecondary Education, and other agencies have made grants and issued contracts to individuals and institutions in support of innovative procedures, projects and programs. Evaluation of the results is minimal. There is a need to coordinate innovation efforts across the country and provide feedback to improve and verify the efforts in-place. Selective comparisons should be made between alternative approaches to determine why one works and another doesn't. The development of partnerships with foundations and other agencies could be a significant development for NIE. Care should be

taken in forming these partnerships so as to avoid the impression that the NIE is an audit agency or that its efforts are intended for use in critical ways. The results of the studies should be useful to the Foundations and Federal agencies. By conceptualizing major dimensions of innovations as NIE has done in open education, evaluation of several programs at differing points on the scale can produce conclusions of greater generality and adaptive use than would evaluations of each project as an entity.

Data

One of the most often heard criticisms has been about the type and quality of data available for research, policy studies, and operational analyses. Some of the data needs are sophisticated, some basic. Data collecting and analysis agencies such as the National Center of Educational Statistics accumulate extensive data from the field. Analysis and verification of this data is oftentimes a lengthy procedure, and when it finally becomes available its value may be reduced because of its age. Much of the data collected is needed for single use or short-time needs assessment. Surveys for certain data are run on an annual basis and analyses demonstrate trends and comparative conditions across time. One of the more important survey types is the longitudinal survey. Longitudinal surveys are extremely important in that they trace a sample across time. Unfortunately, funding in the out years is a major problem.

It does not seem to us that NIE should become another major data collection agency. The Institute should, however, take a strong leadership role in identifying and recommending data needs, in setting priorities for collection and in encouraging other private and Federal agencies to maintain

those data bases including longitudinal, necessary for many kinds of educational research. Research is also needed on better instruments and methodology.

VI. Summary and Recommendations

In the preceding sections we have reviewed various areas of research suggested to us by those with whom we have talked. In this section we hope to describe certain areas we feel are of highest priority and to discuss briefly mechanisms of implementing and following up our work in NIE. We also will bring in some broader considerations of NIE strategies and mechanisms.

In choosing areas of high priority we have given weight to the following considerations:

1. The importance of the problem area for decisions affecting the education of students. Here we are concerned not only about the importance of the decisions involved but also the links of a problem area with other subsidiary or related problems and the degree to which information with respect to this problem area would have usefulness in these related areas.
2. The relationship for the problem area to broader theories or conceptualizations going beyond education. For example, we were influenced by the relationship of areas to new developments in cognitive psychology, economic models, or sociological theory.
3. The availability of methodological tools. Here we were

influenced by such things as the development of methodology having to do with quality of life and social indicators as well as methodological developments in econometrics and other areas.

4. The relationship of the area to present NIE strengths. We see NIE as having a pool of high level talent. We tried to think about how our problem areas might fit with the current programs and human strengths of the NIE organization. Much of what we suggest is already going on in NIE.

High Priority Areas

We have chosen seven areas as candidates for the highest priority. For us this has been a difficult choice because each of the areas mentioned in the earlier sections has appealing characteristics in terms of our curiosity about the answers and in terms of potential impact upon education. Nevertheless, we understand that our task is to at least provide a beginning point for discussions for setting priorities in postsecondary education and thus suggest the following:

1. Learning and cognition
2. Motivation and values
3. Teaching -- delivery systems
4. Evaluation of Outcomes -- Assessing the value of postsecondary education
5. Governance and management
6. Costs and finance of postsecondary education
7. Interfaces between secondary and postsecondary education, and work.

The matrix below gives our impressions of where each of these themes fits within the present structure. Obviously, the NIE staff knows better than we where relevant work is, or should, go on. In any case, we believe that it is likely that the postsecondary area is one requiring cooperation across Groups.

High Priority Areas	Basic Skills	Education and Work	Education Equity	Finance and Productivity	Capacity Problem Solving
Learning and Cognition	x	x	x		
Motivation and Values	x	x	x		x
Teaching-Delivery Systems	x	x	x	x	x
Evaluation of Outcomes	x	x	x	x	x
Governance and Management			x	x	x
Costs and Finance		x	x	x	
Interfaces between Secondary/Post-secondary/Work		x	x	x	

From this account, it appears that we have neglected the Dissemination and Resources Group. Obviously, dissemination is as important in postsecondary education as in the other levels of education. We believe there is a special need for work summarizing the state of research in a number of areas. Some

of the Foundations, for example, have suggested that it would be useful to them to have a summary of research indicating areas ripe for application. They see NIE as providing a possible basis for their decisions about areas in which support would likely to be productive. The present publications of ERIC probably meet some of these needs, but it may be that there is a need for the capability of putting together such summaries with respect to particular areas with a shorter turn-around time.

Some of our consultants have despaired of reaching the faculty. Admittedly, reaching faculty is difficult, but there are a number of hopeful aspects of the present situation. One of these is the rapid growth of faculty development centers in most colleges and universities. While such centers still have much to do they are reaching large numbers of faculty and provide an important new channel for dissemination. A second factor is the increased interest of the scholarly associations in teaching and undergraduate education. New divisions are being formed; new journals are being started. Thus, the disciplines provide another communication channel and support system. Finally, the increased emphasis upon teaching and undergraduate education in promotion and salary judgments is changing the reward structures to encourage better utilization of research on learning and teaching.

Linking NIE Groups

One of our hopes in recommending the priority areas above is that they will be mutually supportive. Obviously, research in learning and motivation has implications for teaching, but it may not be so obvious that it has great relevance for work in measuring outcomes and for research on the interface of education and work. Similarly, the research on governance

has links with finance, with teaching, and with the area of motivation and values. Studies of costs and finance link with the interface and governance questions but also have relevance for motivation and teaching.

We believe that by facilitating communication and joint support of programs the total impact of the NIE program can be greater than the sum of its parts.

Mechanisms

The previous section has identified seven major areas for NIE emphasis in postsecondary education. The report has identified other areas of concern that we have reluctantly put in a lower priority. In the development of this report, it has become clear that there are various ways in which NIE could become involved in a given area. In some cases interest demonstrated by a low cost investment and presence would be sufficient, whereas in others a major scale of effort,both in-house and externally,might be appropriate.

We have some feelings about mechanisms but offer them only as starting points for staff discussion.

1. Learning and Cognition

This is the one area in which we recommend support of basic research. Despite the great research progress of the past decade, funding has dropped drastically. At this time the link between basic research on cognition and research on educational learning is tight and research support for both is likely to be productive. This sort of research seems generally to prosper from funding through unsolicited proposals.

2. Motivation and values

In this general area we see as a first step, grant support of

research on factors affecting motivation for continued learning and research on educational influences on value integration and behavior. This too is an area in which the grant mechanism seems appropriate.

3. Teaching -- delivery systems

In this area we see two areas of high priority -- the study of effective teaching at the level of the individual class or course and the broader studies of major aspects of delivery systems, such as open learning. Progress on the former can be made through grant support, the latter seems more appropriate for a contract.

4. Evaluation of outcomes

One likely opportunity for progress is to link NIE's effort to that of some of the organizations now doing research on social indicators and quality of life.

5. Governance and management

Methodology in this area is improving; yet support for research has been declining. Grant support here should be productive.

6. Costs and finance

This is an area in which a number of agencies and organizations are doing research and policy analyses. Thus we do not see a need for a major additional effort by NIE, but believe synthesis of information through conferences or summary reports would be useful. Following such a synthesis NIE might wish to implement a program of grants in response to unsolicited proposals.

7. Interfaces between secondary and postsecondary education and work

In this area NIE already has a number of activities underway. They appear to us well conceived and we trust that support can be continued and strengthened.

Because we believe emphasis should be given to developing the national research capability, we have suggested increased use of the competitive grant process rather than large demonstration projects or major center support. Consideration should be given to ways of fostering assemblages of investigators. At those places where a critical mass of researchers exists, some provision for a "cushion" between funding cycles chouls be provided.

There is also a need for the definition of problems and the development of ideas. An investigator needs a small amount of support to develop the analysis of what should be investigated. Support of this type of activity is hard to find. It would seem appropriate that the Dissemination and Resources group develop an open-ended, quick turn-around, small grant program for projects designed to answer immediately relevant questions or to help in defining problems that research can answer.

Central to the theme of NIE and recommendations made in this report is the necessity to bring the best minds available to work together on the problems of postsecondary education. Research on postsecondary education belongs to no one discipline and NIE should take as one goal that of increasing the number of top flight researchers who are carrying out research in post-secondary education. Presently this area is not prestigeful in any of the relevant disciplines. We believe NIE can attract the best scholars. Appointments in NIE as well as the development of an in-house internship program and support for doctoral and postdoctoral studies can supplement the program of research support in increasing the pool of talent contribution to our field.